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Risk factors for gouty dactylitis

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ABSTRACT

Objective. *To investigate the risk factors associated with dactylitis in gout.*

Methods. *The questionnaires of 73 consecutive gouty patients, diagnosed according to the ACR criteria, were reviewed. They were consecutively screened for the presence of dactylitis.*

Results. *Seven out of 73 (9.6%) patients showed dactylitis. They had (1) longer disease duration, (2) a higher number of involved joints, (3) higher serum uric acid concentration, (4) more tophi, (5) higher ESR, and (6) a higher number of ACR criteria besides crystal identification, than the others. By logistic regression, renal stones (OR 13.3, 95% CI 1.1–158.3), upper extremity involvement (OR 4.9, 95% CI 1.4–16.6), number of ACR criteria (OR 1.9, 95% CI 1.1–3.3), and ESR (OR 1.02, 95% CI 1–1.04), significantly predicted dactylitis.*

Conclusions. *Dactylitis is a feature of gout representing an indicator of disease severity.*

Introduction

Gout is a recurrent inflammatory arthritis induced by precipitation of sodium monourate (MSU) crystals in joint and soft tissues (1). Although described by Hippocrates in the 5th century BC, it is probably underdiagnosed. This may be due to its changing clinical spectrum, for gout is now more frequently poliarticular, involves the hand, affects a wide range of age groups, and its incidence is increasing in women (2). In consideration of this changing clinical pattern, it is often necessary to recognise uncommon clinical features of gout. Dactylitis, is defined as inflammation of a finger or toe (3). In seronegative spondyloarthritides, dactylitis or 'sausage-like' digit is a diffuse painful swelling due mainly to flexor tenosynovitis, but possibly also to soft tissue edema and synovitis (4). The importance of dactylitis in psoriatic arthritis (PsA) is supported by its inclusion in the recently developed classification criteria (5). In addition to being a common hallmark of seronegative spondyloarthrititides, dactylitis has been observed in other diseases, including gout (6). In the first report on gout-associated dactylitis, it was seen in 4/80 (5%) patients and was associated with a poliarticular pattern of disease. No other associations were investigated, however. We have recently reported that 9.6% of 73 consecutive patients with gout show dactylitis and suggested that this feature could be an indicator of more severe disease (7). The present study is concerned with an evaluation of the factors associated with gout dactylitis in the same cohort of patients.

Patients and methods

The structured questionnaires of 73 consecutive patients with gout seen between 2000 and 2007 were retrospectively reviewed. They were consecutively screened for the presence of dactylitis. Gout was diagnosed according to the ACR criteria (8). The following data were collected: a. demographic data including age, gender and family history of gout and psoriasis; b. history of present or previous comorbidities, including diabetes mellitus, hypertension, renal or gallbladder stones, renal insufficiency, cardiovascular or cerebrovascular ischemic events, hyperlipemia, and psoriasis; c. medications, including urate lowering agents (allopurinol, sulphinpirazone), anti-inflammatory agents (colchicine, NSAIDs, corticosteroids), and diuretics; d. clinical features of arthritis including time from the first attack, number of attacks, number and type of involved joints, presence of tophi; e. serum uric acid concentrations, ESR and C-reactive protein. In addition, dactylitis was searched for in all patients and documented by photographs (Fig. 1). Dactylitis or 'sausage-like' digit was diagnosed when a diffuse swelling of a digit or toe was observed directly by a rheumatologist (MAC). The ethical committee of the University of Genova granted approval for the review of the patients' medical data.

Statistical analysis

Means were compared with the Student's *t*-test when data were normally distributed and with the Kruskall Wallis test when they were not parametrical. Categorical data were compared by the Fisher's exact test. The variables resulting significant in univari-

ate analysis and those with a $p<0.07$ were entered in multiple regression and in logistic regression models. P-values <0.05 were considered statistically significant. All statistical calculations were performed with MedCalc version 9.6.4.0 (Belgium).

Results

Of the 73 patients, 63 (86.3%) were men; their mean age was 61.8±13.7 years. 7/73 (9.6%) patients showed dactylitis of at least one finger (5 patients) or toe (2) (Fig. 1). In all the patients with dactylitis, gout was simultaneously confirmed by identifying MSU aspired from the soft tissues or the adjoining joints. Table I shows the comparison of demographic, history, clinical and laboratory findings in patients with or without dactylitis by univariate analysis. Psoriasis occurred in four patients and a family history of psoriasis was recorded in two more; none of them showed dactylitis. Patients with dactylitis had longer disease duration, a higher number of involved joints, higher serum uric acid concentration, more tophi, higher ESR and more ACR criteria besides crystal identification. As expected, the upper extremities, especially the hands, were more often affected by arthritis. In multivariate stepwise regression analysis, tophi (p=0.003), elevated serum uric acid concentration (p=0.005), renal stones (p=0.014), ESR (p=0.024), and hand involvement (p=0.047) were associated with dactylitis. By logistic regression, renal stones (OR 13.3, 95% CI 1.1–158.3), upper extremity involvement (OR 4.9, 95% CI 1.4–16.6), high number of ACR criteria fulfilled (OR 1.9, 95% CI 1.1–3.3), and ESR (OR 1.02, 95% CI 1–1.04), significantly predicted dactylitis.

Discussion

Dactylitis has been described in different diseases besides seronegative spondyloarthritis, including infections, sarcoidosis, and sickle cell disease. In several of these conditions, inflammation may be absent, raising the question if the term dactylopathy could be more appropriate. In gout, digit involvement can be caused by different mechanisms including an inflammatory condition

Fig. 1. Dactylitis of several fingers, in a patient with chronic tofaceous gout. Her disease was misdiagnosed as systemic sclerosis because of non extensible skin over the fingers and "calcinosis", which in fact was due to MSU deposition.

Table I. Features associated with gout in patients with and without dactylitis.

Feature	Dactylitis +	Dactylitis –	p-value
Number	7	66	
Gender (males)	5 (71.4%)	58 (87.9%)	0.24
Age (years)	60.8 ± 14.9	61.9 ± 13.8	0.86
Family history	1 (14.3%)	8 (12.1%)	1
Diabetes mellitus	0 (0%)	12 (16.9%)	0.58
Hypertension	3 (42.9%)	33 (50%)	1
Cardiovascular	2 (28.6%)	5 (7.6%)	0.13
Cerebrovascular	1 (14.3%)	3 (4.5%)	0.34
Hyperlipemia	0 (0%)	12 (18.2%)	0.33
Renal insufficiency	3 (42.9%)	8 (12.1%)	0.064
Renal stones	3 (42.9%)	8 (12.1%)	0.064
Gallstones	0 (0%)	5 (7.6%)	1
Psoriasis	0 (0%)	4 (6.1%)	1
Disease duration (months)	108 (32–486)	40 (1–454)	0.030
No. of attacks	14 (1-40)	4 (1–90)	0.12
Monoarthritis	1 (14.3%)	32 (48.5%)	0.11
No. of involved joints	3 (1–4)	2 (1–4)	0.021
Lower extremity joints	1 (0–2)	1 (0–3)	0.32
First MTP	4 (57.2%)	41 (62.1%)	1
Ankle	1 (14.3%)	18 (27.3%)	0.75
Knee	2 (28.6%)	24 (36.4%)	1
Upper extremity joints	1.5 (0–2)	0 (0–3)	0.009
Hand	5 (71.4%)	13 (19.7%)	0.008
Wrist	3 (42.9%)	10 (15.2%)	0.10
Elbow	0 (0%)	9 (13.6%)	0.58
Presence of tophi	6 (85.7%)	15 (22.7%)	0.002
Serum uric acid (mg/dL)	10.1 ± 3.0	8.1 ± 1.9	0.013
ESR (mm/h)	53.5 (7–115)	12 (2–130)	0.03
CRP (mg/dL)	15 (1–68)	8.2 (1–326)	0.32
Allopurinol	1 (14.3%)	24 (36.4%)	0.41
Colchicine	1 (14.3%)	10 (15.2%)	1
NSAIDs	5 (71.5%)	33 (50%)	0.40
Corticosteroids	2 (28.6%)	7 (10.1%)	0.20
Diuretics	2 (28.6%)	20 (43.6%)	1
No. of ACR criteria	7.7 ± 2.1	5.6 ± 1.7	0.003

characterised by arthritis, tenosynovitis, and soft tissue edema (true dactylitis), and a circumferential deposition of MSU crystals without inflammation (dactylopathy) (7). To our knowledge, only one previous paper (6), published 15 years ago, has considered gout as a cause of dactylitis before our observation (7). The clinical and MRI features of MSU deposition around phalanges and tendons, as immediate cause of dactylitis, have been already accurately described by Popp *et al*. (9) who, however, did not recognise dactylitis as such. In our series, dactylitis was twice as common as before, and affected almost 1/10 of patients. Dactylitis was associated with long-lasting, severe forms of gout, characterised by high serum uric acid concentration, numerous affected joints, numerous tophi, and high ESR. Renal stones also predicted the occurrence of dactylitis. Tophi occurred in a high percentage of patients with gouty dactylitis (85.7%), and in 28.8% of the whole sample of patients. This finding is probably related to the fact that MSU deposition in the tissues is an important component of dactylitis. In another study, tophi were seen in 12% of patients after 5 years from the clinical diagnosis of gout and in 55% of patients after 20 years of disease (10). In the other study of patients with the dactylitis of gout, serum uric acid was normal. A consideration explaining these differences in incidence and clinical findings is that the pathological pattern of gout has changed (2). In addition, the fact that patients with dactylitis fulfilled more ACR criteria supports the view that this is a typical, although not common, feature of gout. Based on our findings, we expect that patients with dactylitis show a poorer physical function in comparison with those without. The HAQ Disability Index could be a valuable method to assess these differences as recently demonstrated (11), but unfortunately it was not utilised in the present study. Since our results need to be confirmed in a study of a large prospective population of gouty patients, a measure of physical function should be included in it.

In conclusion, our data support the view that dactylitis is a typical feature of gout and represents an indicator of disease severity. This observation carries two main implications: i) gout should be included in the differential diagnosis of patients with dactylitis and ii) patients with gout and dactylitis deserve an effective management, which is still far from being achieved in this disease (12).

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